

REMARKS

Claims 1–7 are pending in the application. In the final Office action dated March 3, 2010, claims 1–7 were rejected. Responsive to the Office action, claims 1–7 are amended and new claim 8 is added. In view of the amendments above, and the remarks below, Applicant respectfully requests reconsideration of the application.

Request for Continued Examination

In order to ensure that the above amendments are entered, and the following remarks are given full consideration, Applicant is concurrently submitting a Request for Continued Examination under 347 C.F.R. § 1.114, including the appropriate fee under 37 C.F.R. § 1.17(e).

The Locking Device in Operation

In order to assist the Examiner in understanding the nature of the claimed subject matter, Applicant has included with this electronic filing a PDF document ("Locking Device Slides") that contains a series of still images illustrating an exemplary locking device securing a pipe connection.

Unfortunately, video files cannot be submitted via EFS. However, Applicant will also send the short video file ("Locking Device in Operation"), from which the images were taken, directly to the Examiner for reference. Applicant suggests that the still images and particularly the video help demonstrate both the construction and the operation of the claimed locking device.

Objections to the Drawings

The drawings are objected to for the following reasons:

The action asserts that the drawings fail to show every feature of the invention specified in the claims, and suggests that the teeth and the notches in the teeth must be shown in the drawings or those features canceled from claim 5.

Responsive to the objection, Applicant has amended claim 5 to recite “teeth and the notches in which the teeth engage”. Amended claim 5 more accurately defines the claimed invention, such that the claimed invention is clearly depicted in the drawings. In view of the amendment to claim 5, Applicant respectfully requests the objection to the drawings be withdrawn.

Objections to the Claims

Claims 1, 2, and 6 are objected to because of the following informalities:

The words --each of--should be added before the phrase "the locking rings" in line 7 of claim 1. Applicant has amended claim 1 as suggested by the Examiner.

In claim 2, the word "in" after the words "to slide" in line 2 should be deleted. Applicant has amended claim 2 as suggested by the Examiner.

In claim 6, the semi-colon after the word "steps" in line 3 should be replaced with a colon. Applicant has amended claim 2 as suggested by the Examiner.

In addition, claim 6 is objected to in that it does not appear from the drawings that the connection is screwed together before the locking rings are brought into engagement with the connection units. Applicant respectfully disagrees.

As set out in the Brief Description of the Figures, Figure 1 of the application depicts an exploded view of the claimed locking device. The exploded view is not intended to reflect the process of connecting the locking device, or the steps of the method of claim 6. As set out in original claim 6 as published in the International Publication WO 2005/026494, the method includes:

- arranging two locking rings (1, 2), which engage each other via teeth (4,5) and notches on their first sides, on a shoulder (15, 16) of the connection units (7, 8),
- screwing the connection units (7, 8) together,

- bringing the teeth (4, 5) and notches of the second sides of the locking rings (1, 2) to engagement with the notches (11, 12) and teeth (9, 10) of the connection units (7, 8) after screwing the connection units (7, 8) together,
- spreading the rings (1, 2) apart in axial direction,
- locking the locking rings (1, 2) with respect to each other in axial direction by means of locking devices (13)

Applicant respectfully suggests that the specification clearly describes the sequence of first screwing together the threaded connection units, and subsequently engaging the locking rings with their respective connection units.

In view of the above amendments and remarks, Applicant respectfully requests the withdrawal of the objections to claims 1, 2, and 6.

Rejections under 35 U.S.C. § 112

Claims 1–7 are rejected under 35 USC § 112, second paragraph as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Office action asserts that "it does not appear that Applicant is claiming the two connections units as Applicant has not positively recited the connection units." Further, the action asserts that it is not clear what Applicant is intending to claim in reciting that the connection units are locked "angularly" with respect to each other.

Responsive to the rejection, Applicant has amended claim 1 to recite a locking device that includes the first and second connection units, as well as the first and second locking rings. Additionally, Applicant has amended the specification to replace the term "angularly" with the alternative term "rotationally". Claim 1 has additionally been amended to state that when the axial lock of the claimed locking device is engaged "rotation between the first and second connection unit is prevented."

Applicant has further taken this opportunity to amend claim 1 to more specifically recite the claimed locking device, including in particular the interrelationship between the various components of the claimed locking device. Support for the amendments may be found at pages 4-6 of the specification and in Figures 1-12. Applicant respectfully suggests that, as amended, claim 1 particularly and definitely describes the claimed invention. Applicant has appended a clean copy of the amended claims for the convenience of the Examiner and to facilitate examination.

Claim 2 has been amended to recite locking rings that are "arranged to slide rotationally and axially on the connection units while remaining disposed concentrically on the pipe connection." Applicant has also deleted reference to the shoulders on the connection units. Applicant respectfully suggests that, as amended, claim 2 particularly and definitely describes the claimed invention.

With respect to claim 4, the amendments to claim 1 have provided appropriate antecedent basis for the claim element "the connection units." Applicant suggests that, in view of the amendment to claim 1, claim 4 now particularly and definitely describes the claimed invention.

Applicant has amended claim 5 to recite "the teeth and the notches in which the teeth engage." Applicant suggests that, as amended, claim 5 now particularly and definitely describes the claimed invention.

With respect to claim 6, Applicant has amended claim 1 to recite a locking device wherein the second sides of the first and second locking rings face the first and second connection units, respectively, and are configured to engage a corresponding number of notches and teeth formed on a shoulder of a facing edge of their corresponding connection units. Applicant suggests that claim 1 provides sufficient antecedent basis for reciting "the shoulders of their corresponding connection units" as recited in claim 6. Applicant suggests that claim 6 now particularly and definitely describes the claimed invention.

Applicant takes this opportunity to add new claim 8. Support for the new claim may be found in the specification at page 4, lines 15–22; and page 5, line 33 to page 6, line 12.

In view of the above amendments to the claims, and the associated remarks, Applicant respectfully suggests that claims 1–7 as well as new claim 8 clearly and particularly define the claimed subject matter. Applicant therefore requests the withdrawal of the rejection of claims 1–7 under 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 102

Claims 1–7 are rejected under 35 U.S.C. § 102(b) as being anticipated by Myers et al. (U.S. Patent no. 4,655,482).

Applicant respectfully disagrees, for at least the reasons provided below.

As amended, the locking device of claim 1 includes:

- a first and a second connection unit which are threaded and include a female and a male threaded section, respectively, where the connection units are configured to be screwed together to form a pipe connection;

- a first and a second locking ring disposed between the first and second connection units and concentric with the pipe connection, each locking ring having a first and a second side; and

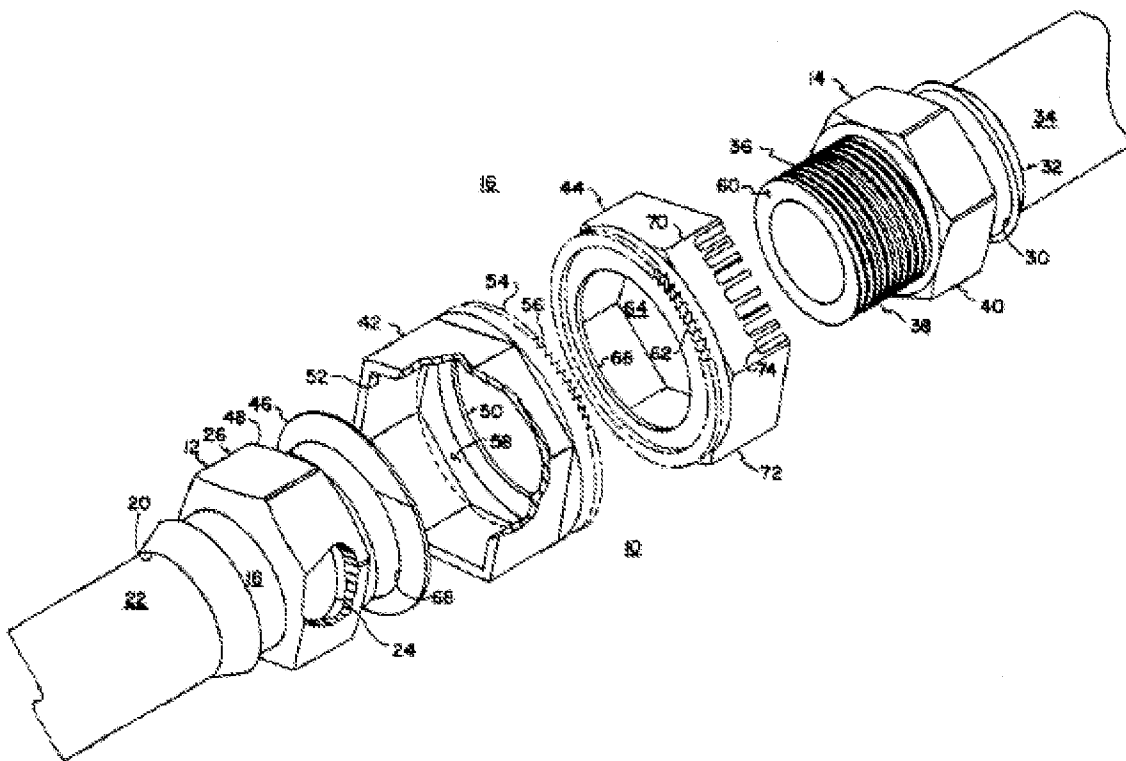
- an axial lock configured to prevent the first and second locking rings from moving towards each other in an axial direction when engaged;

- characterized in that the first and second side of each of the locking rings each comprise a plurality of teeth separated by intermediate notches, such that the teeth and notches on the first sides of the first and second ring are configured to engage each other; and the teeth and notches on the second sides of the first and second ring face the first and second connection units, respectively, and are configured to engage a corresponding number of notches and teeth formed on a shoulder of a facing edge of their corresponding connection units, the number of teeth and notches on the second side of the first ring being different from the number of teeth and notches on the second side of the second ring;

so that upon screwing together the first and second connection units, the first and second locking rings may be revolved together to a position in which they may be spread partially apart in an axial direction to engage the second sides of the locking rings with their corresponding connection units and, at the same time, maintain the mutual engagement between the first sides of the first and second rings, so that when the axial lock is engaged to maintain the separation between the first and second locking rings, rotation between the first and second connection unit is prevented.

The action asserts that interlocking sleeves 42 and 44 of Myers et al. correspond to the first and second locking rings of the claimed locking device, and that ratchet teeth 56 and 62 correspond to the teeth and notches of the first sides of the locking rings, while notches 74, threads 82, and receptacles 84 and 86 correspond to the notches and teeth formed on the second sides of the locking rings (see the Office action at page 7, para. 5). Applicants respectfully suggest that Myers et al. fail to disclose a locking device as recited in claim 1.

The tube coupling device of Myers et al. is illustrated below in Fig. 1 of Myers et al.:



As set out in claim 1, the first and second locking rings are characterized in that the first and second side of each locking ring includes a plurality of teeth separated by notches. The teeth and notches on the first sides of the locking rings are configured to engage each other, while the teeth and notches on the second sides of the locking rings face the connection units and engage corresponding notches and teeth on the corresponding connection units.

The Myers et al. device, however, features ratcheting teeth 56 between sleeves 42 and 44. As discussed previous, ratchet teeth are unidirectional only, and while they provide a locking action with respect to one direction of rotation, they provide no locking action whatsoever in the opposite direction of rotation.

Furthermore, the second sides of sleeve 42 fails to display any teeth and notches, and of course cannot therefore display teeth and notches that correspond to teeth and notches on fitting member 12. While the action asserts that notches 74 correspond to the teeth and notches on the second locking ring, Applicant notes that there are no corresponding teeth and notches on fitting member 14. Sleeves 42 and 44 therefore cannot be configured to "engage corresponding notches and teeth on the corresponding connection units."

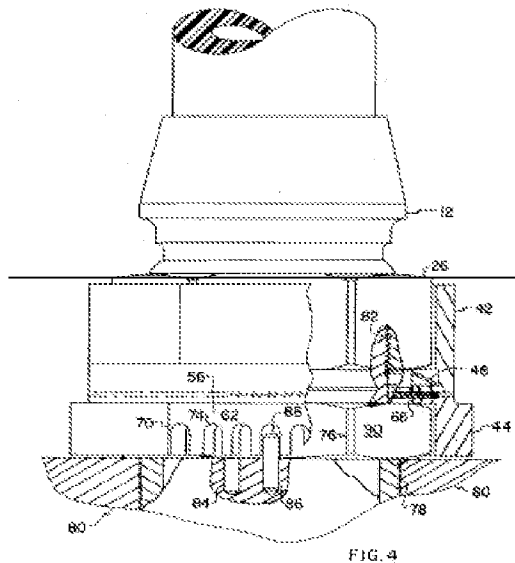
Furthermore, the claimed locking device is necessarily configured such that "upon screwing together the first and second connection units, the first and second locking rings may be revolved together to a position in which they may be spread partially apart in an axial direction to engage the second sides of the locking rings with their corresponding connection units." The Myers et al. device is incapable of such operations, as "sleeve 42 is generally annular, having a hexagonally keyed opening 52 sized to fit closely around nut 26 of fitting member 12 with little or no play or slippage whereby nut 26 is rotationally locked to sleeve 42" (col. 2, lines 40–43). Similarly, hexagonally keyed opening 64 of sleeve 44 is "sized to closely fit around gripping or nut region 40 with little or no slippage" and "gripping region 40 forms a fixed integral part of fitting member 14" (see col. 2, line 66 to col. 3, line 5).

That is, as fitting members 12 and 14 are screwed together, the two faces of sleeve 42 and 44 come into contact, and the ratchet teeth 56 and 62 engage. The connection may then be tightened further, but cannot be loosened, due to the one-way nature of the ratchet between them. Once tightened, sleeves 42 and 44 cannot be rotated further, as they fit precisely over the hexagonal portions (26, 40) of the fitting members.

Furthermore, once tightened, sleeves 42 and 44 cannot be "spread partially apart in an axial direction to engage the second sides of the locking rings with their corresponding connection units" while maintaining the "mutual engagement between the first sides of the first and second rings," as recited in claim 1. Once tightened, the fitting of Myers et al. does not permit sleeves 42 and 44 to move apart, and if they were to move apart, the locking action provided by the ratchet teeth on their interior faces would be disengaged, defeating the purpose of the Myers et al. device.

The action asserts that Myers et al. disclose notches and teeth formed on the second sides of the locking rings (74, 82, 84, 86) facing the respective connection units, where the notches and teeth are formed to engage a corresponding number of notches and teeth formed on a shoulder of the facing edge of the connection units after the rings are spread apart (page 7, last para). Applicant respectfully disagrees.

First, as discussed above, once the connection of Myers et al. is tightened, sleeves 42 and 44 cannot spread apart. In addition, notches 74 in sleeve 44 do not have corresponding teeth and notches on the face of fitting member 14. The elements 82, 84, and 86 identified by the Examiner correspond to another embodiment of the fitting device of Myer, one for connecting a coupling to a bulkhead, as shown in Fig. 4 of Myers et al.:



The bulkhead 80 includes receptacles 84 and 86 that are adjacent to, but not incorporated into, sleeve 44. Notches 74 of sleeve 44 cannot engage the receptacles 84 and 86 directly, and can only do so when a pin 88 is first inserted into one of the receptacles.

Applicant suggests that a fitting to a bulkhead does not correspond to a pipe fitting, as recited in claim 1. Furthermore, two apertures in a bulkhead, coupled with a removable pin, fail to constitute the teeth and notches present on the connection unit of the claimed locking device.

With respect to the method recited in claim 6, Applicant respectfully suggests that Myers et al. fail to disclose a method utilizing the locking device of claim 1 that includes:

- screwing the threaded connection units together;
- revolving the first and second locking rings simultaneously to bring the teeth and notches on the second sides of the first and second locking rings into alignment with the corresponding notches and teeth on the shoulders of their corresponding connection units;
- spreading the first and second locking rings partially apart in an axial direction;
- engaging the teeth and notches of the second sides of the locking rings with their corresponding connection units while maintaining the mutual engagement between the teeth and notches of the first sides of the first and second rings; and
- engaging the axial lock, thereby locking the connection units with respect to a rotation between the first and second connection unit.

As indicated above, a) once the threaded connection of Myers et al. is screwed together, sleeves 42 and 44 are prevented from revolving further; b) there are no corresponding teeth and notches on the shoulders of the connection units of Myer; and c) once the threaded connection of Myers et al. is screwed together, sleeves 42 and 44 cannot be spread apart in an axial direction. For at least these reasons, Applicant suggests the method of claim 6 is not disclosed by the Myers et al. reference.

In order to anticipate a claim, the cited reference must disclose each and every element of that claim, as it is set out in that claim. In view of the above amendments and remarks, Applicant suggests that the Myers et al. reference fails to disclose the locking device of claim 1. As claims 2–6 depend directly or indirectly from claim 1, Applicant suggest they are not anticipated by the Myers et al. reference for at least the reasons provided for claim 1. In addition, Applicant suggests the Myers et al. reference fails to disclose the method of claim 6. As claim 7 depends from claim 6, Applicant suggests it is similarly not anticipated by the Myers et al. reference.

In view of the above amendments and remarks, Applicant respectfully requests the withdrawal of the rejection of claims 1–7 under 35 U.S.C. § 102.

Conclusion

Applicant believes that this application is now in condition for allowance. Accordingly, Applicant respectfully requests that the Examiner issue a Notice of Allowability covering the pending claims. Please charge any additional fees required, or credit any overpayments, to our Deposit Account No. 11-1540. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned agent of record.

Respectfully submitted,

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CERTIFICATE OF ELECTRONIC FILING

I hereby certify that this correspondence is being submitted to the U.S. Patent and Trademark Office via the EFS-Web Electronic Filing System on August 3, 2010.

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